

Harry S. Truman Reservoir Flood Control Operations

An overview of operations

Water Management Section

Hydrologic Engineering Branch

Kansas City District

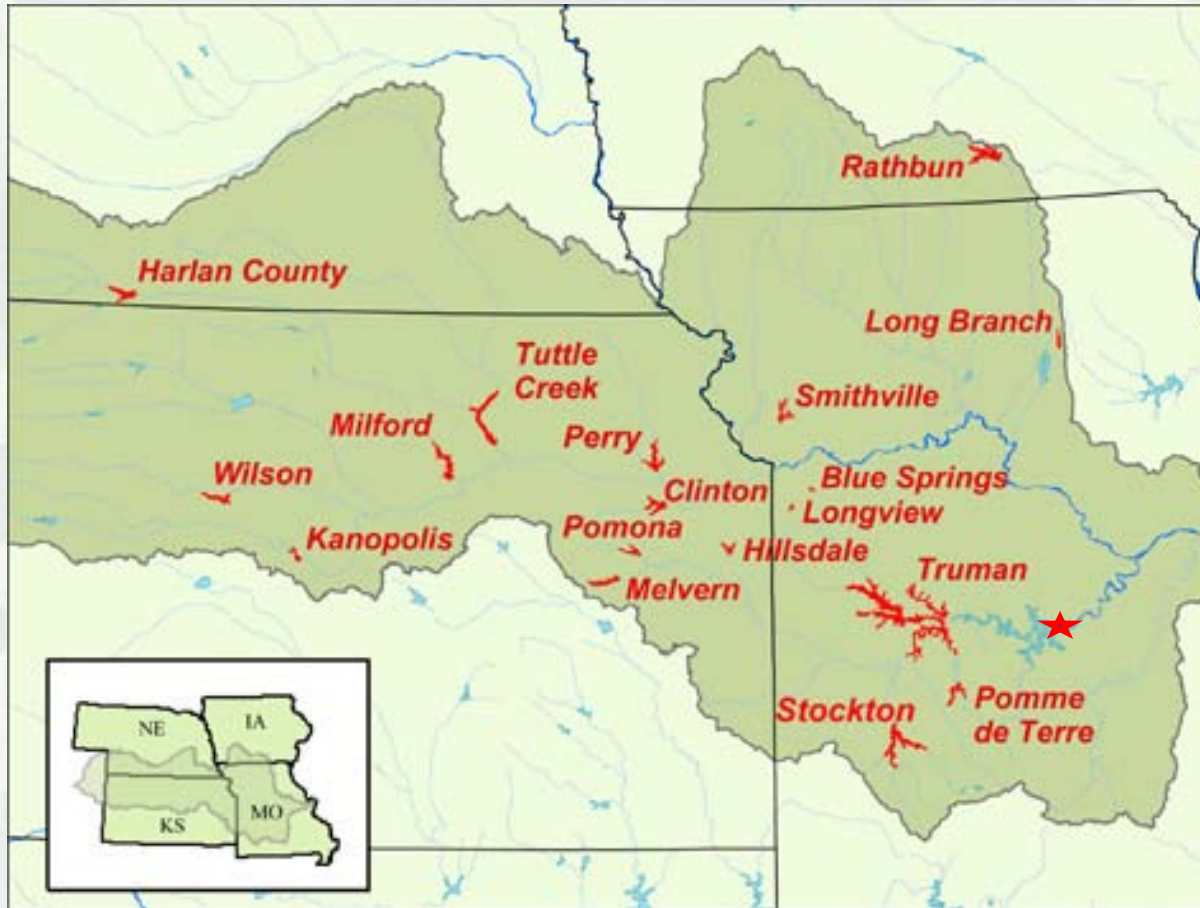
October 2010



US Army Corps of Engineers
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U.S. Army Corps of Engineer Kansas City District



- Total of 18 USACE lakes
- Total 11 Bureau of Reclamation lakes



Osage River Basin

~15,000 square miles

Lakes in Kansas:

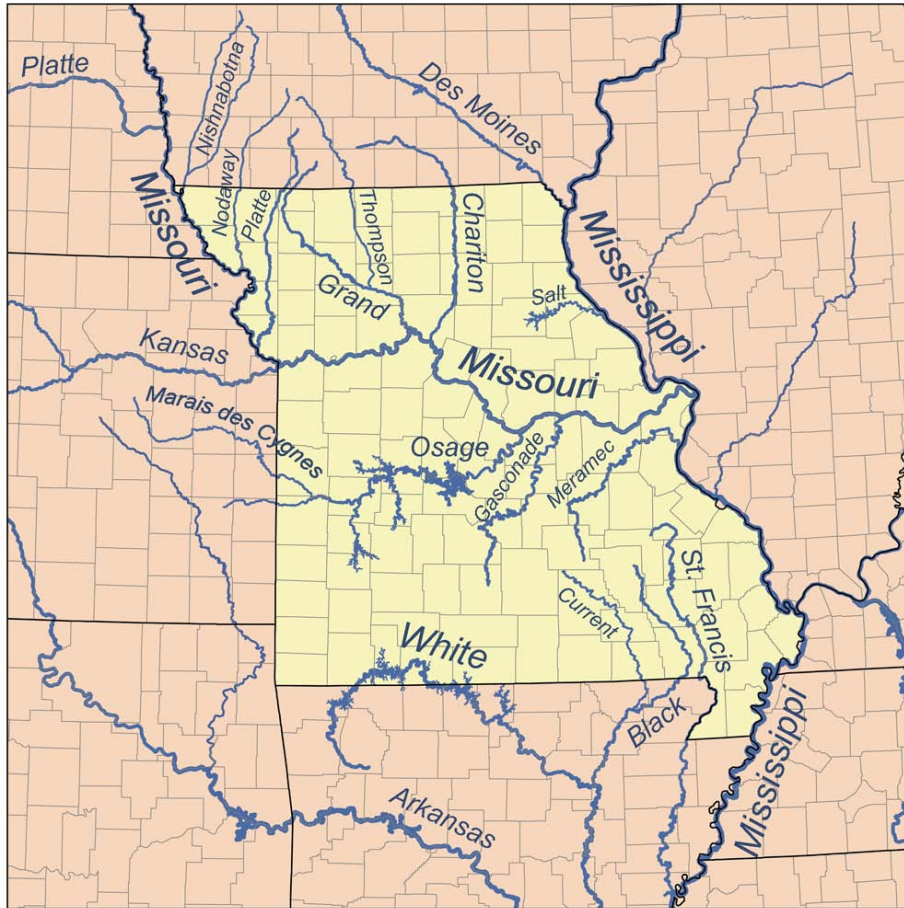
- Melvern
- Pomona
- Hillsdale

Lakes in Missouri:

- Stockton
- Pomme De Terre
- Harry S. Truman
- Lake of the Ozarks, Bagnell Dam



Water Management



- WM's job is to regulate KCD lake releases
- KCD water flows contributes to Mississippi River, impacting
- This requires coordination to follow regulations



Authority

Construction of Harry S. Truman Reservoir:

- Flood Control Act of 1954
- Flood Control Act of 1962

Regulation:

- Lake Regulation Manual



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Authorized Purposes

Harry S. Truman Reservoir

- Flood Control
- Hydroelectric Power Production
- Water Supply
- Recreation
- Fish and Wildlife



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Flood Control Operations

Harry S. Truman Dam

Lake Regulation Manual

- ▶ Flood Control Storage Zones: Phase lines
- ▶ Control Points: Specific location downstream with measured flow
- ▶ Osage System Operation
 - Tandem Balance – Limiting releases from Corps lake projects upstream of Truman
 - Bagnell Dam – Coordination of releases looking downstream



Harry S. Truman Operations

Pool Elevations as Defined by the Lake Regulation Manual:

Surcharge Operations – pool elevation 739.6 ft or greater

*to preserve the structure with out unduly
endangering downstream communities*

Flood Control Operations – pool elevation 706.0 ft to 739.6 ft

*regulation of flood control storage by evacuating water
accumulated in the exclusive flood control storage space
as rapidly as downstream channel capacities and flow
conditions permit*

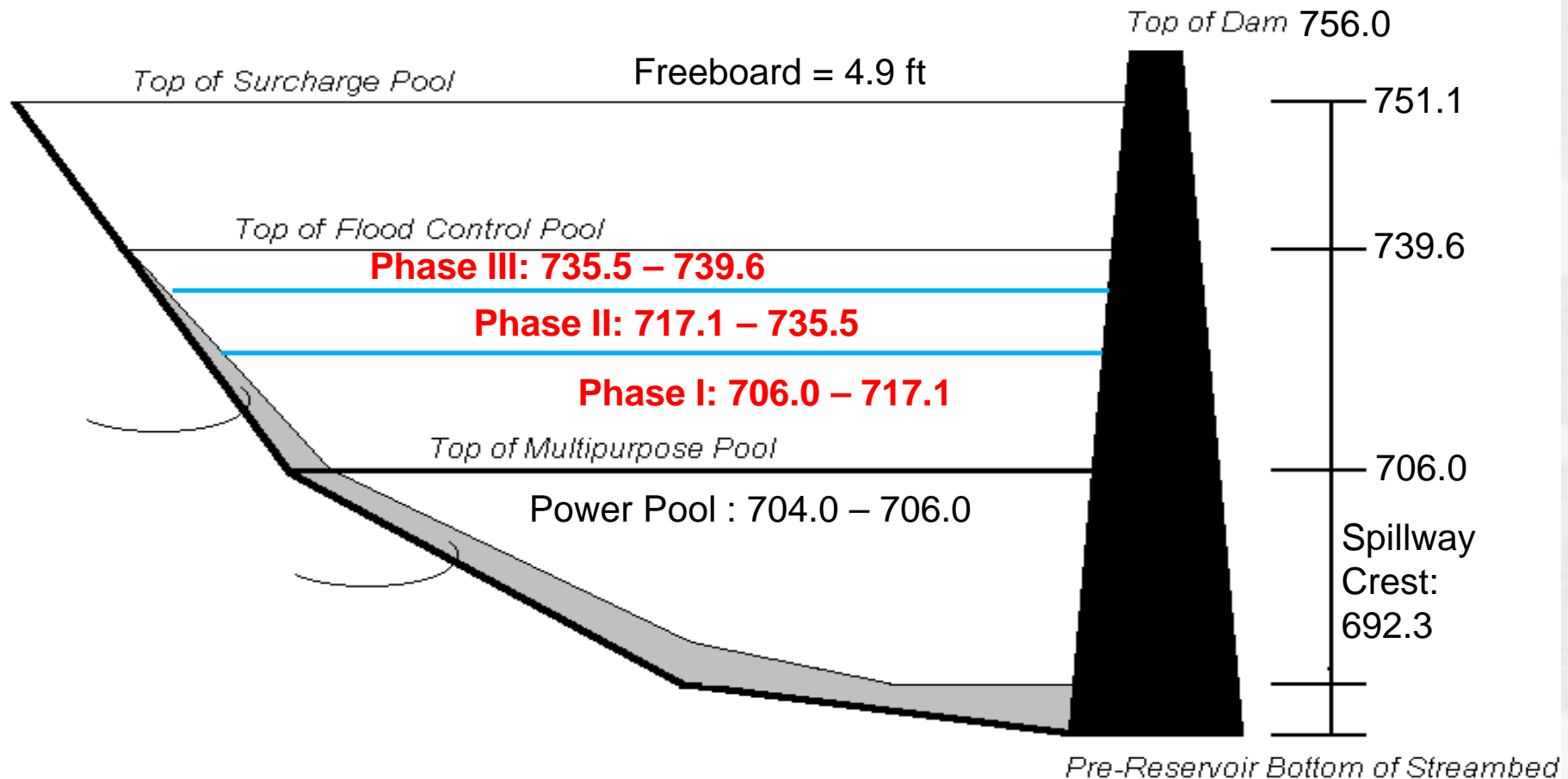
Power Operations, multipurpose – pool elevation 704.0 ft to 706.0 ft

*operations governed by various agreements to
preserve/balance/consider interests of all stakeholders*



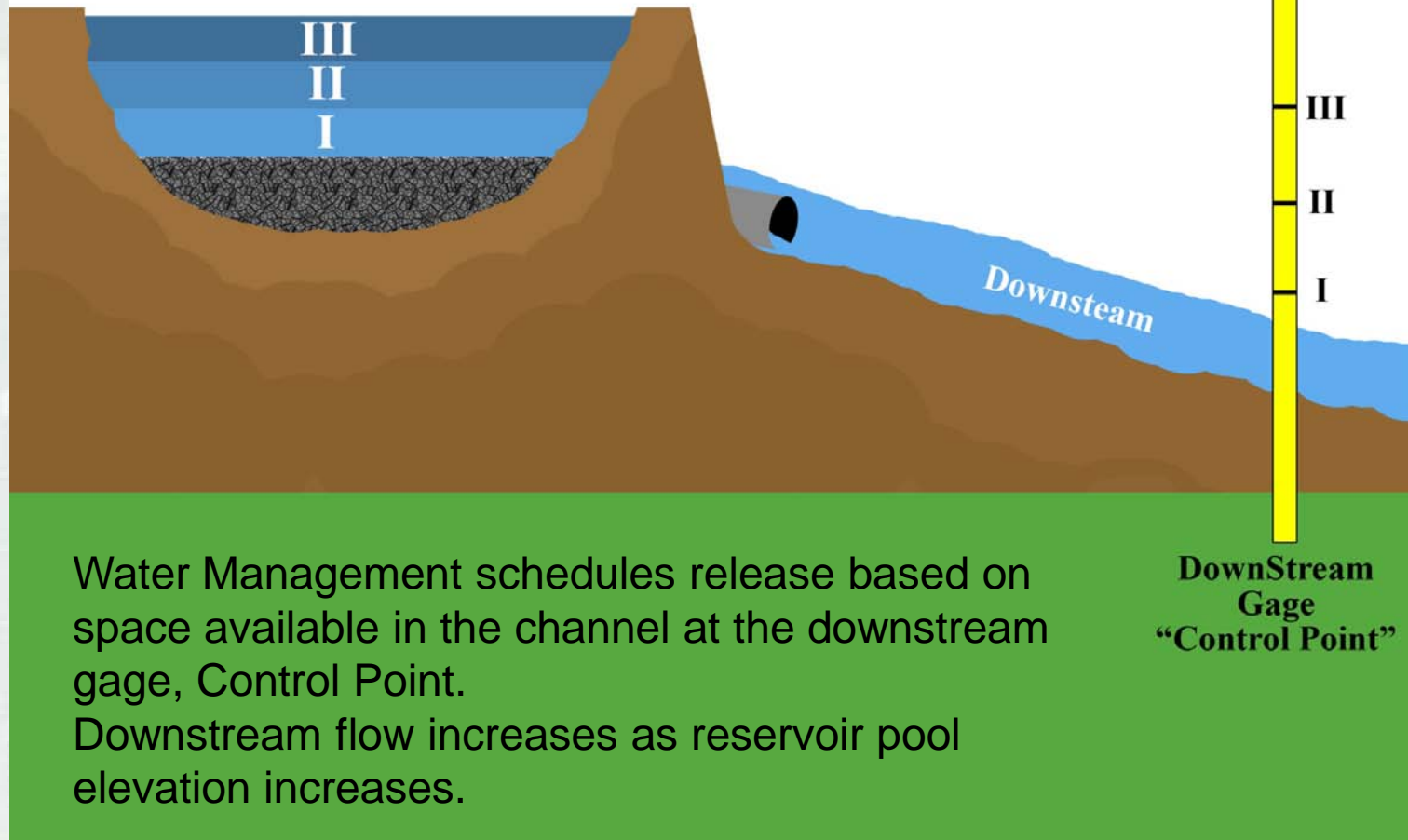
Harry S. Truman Reservoir

Significant Reference Elevations



Relationship between Control Points and Flood Control Zones

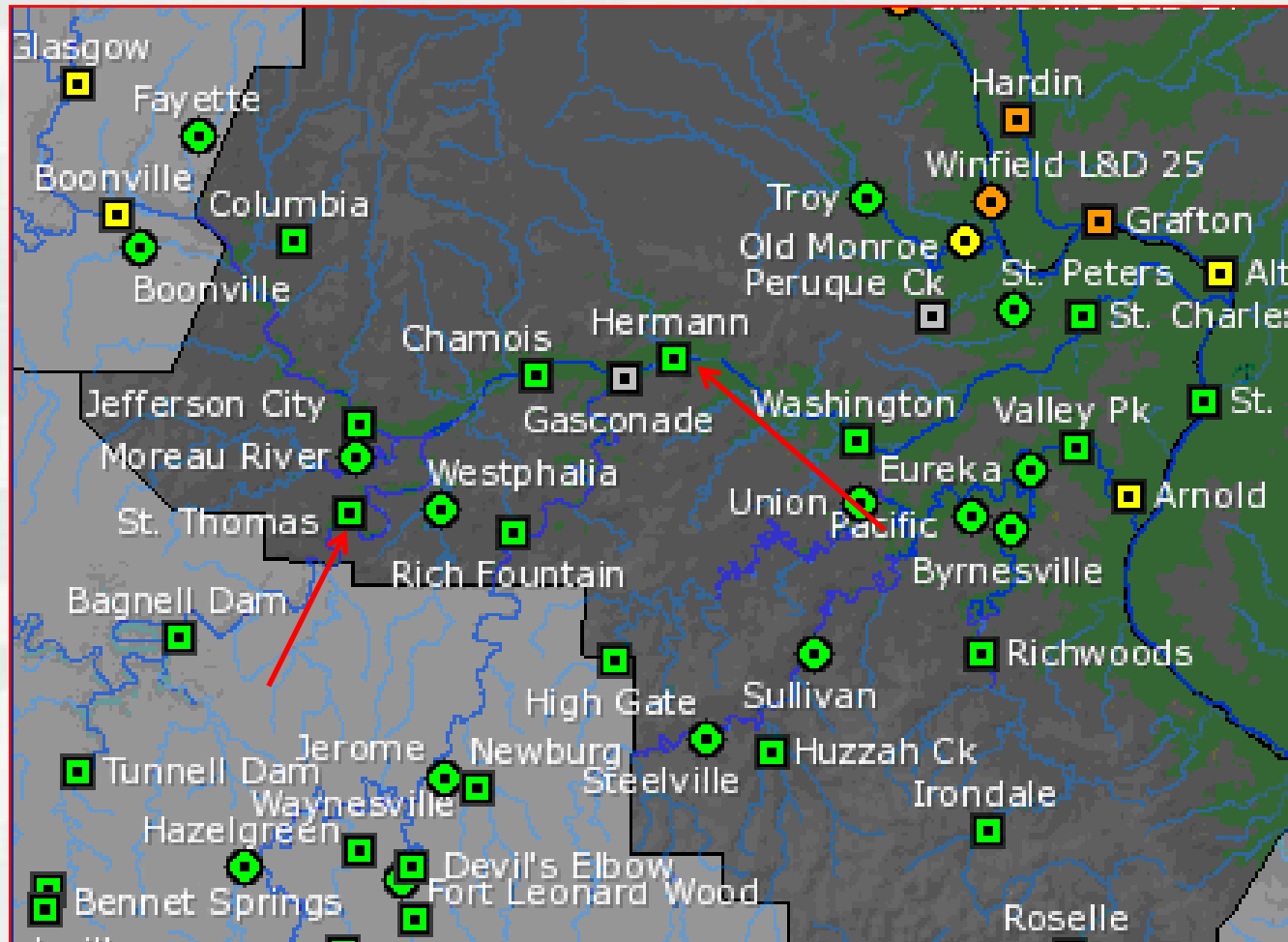
Flood Control Zones



Water Management schedules release based on space available in the channel at the downstream gage, Control Point.
Downstream flow increases as reservoir pool elevation increases.



Control Points and Associated Flow Limits



Criteria flows

St. Thomas:

Phase I: 34,000 cfs

Phase II: 54,000 cfs

Phase III: 80,000 cfs

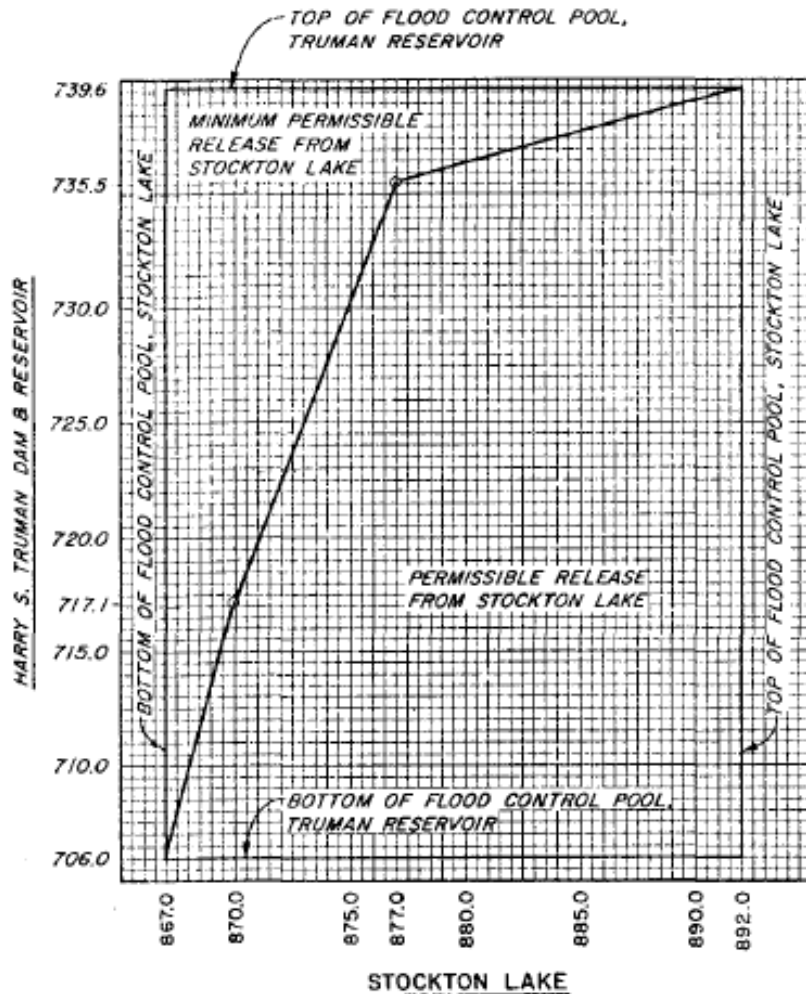
Hermann:

Rising: 260,000 cfs

Falling: 90% of crest



Tandem Balance



Reservoirs located such that a release from one becomes inflow to another are subject to tandem balancing.

Tandem balance limits releases from an upstream project when downstream flood control storage would otherwise be disproportionately filled.

The upstream lake projects Melvern, Pomona, Hillsdale, Pomme De Terre, and Stockton are operated in tandem with Harry S. Truman Reservoir.

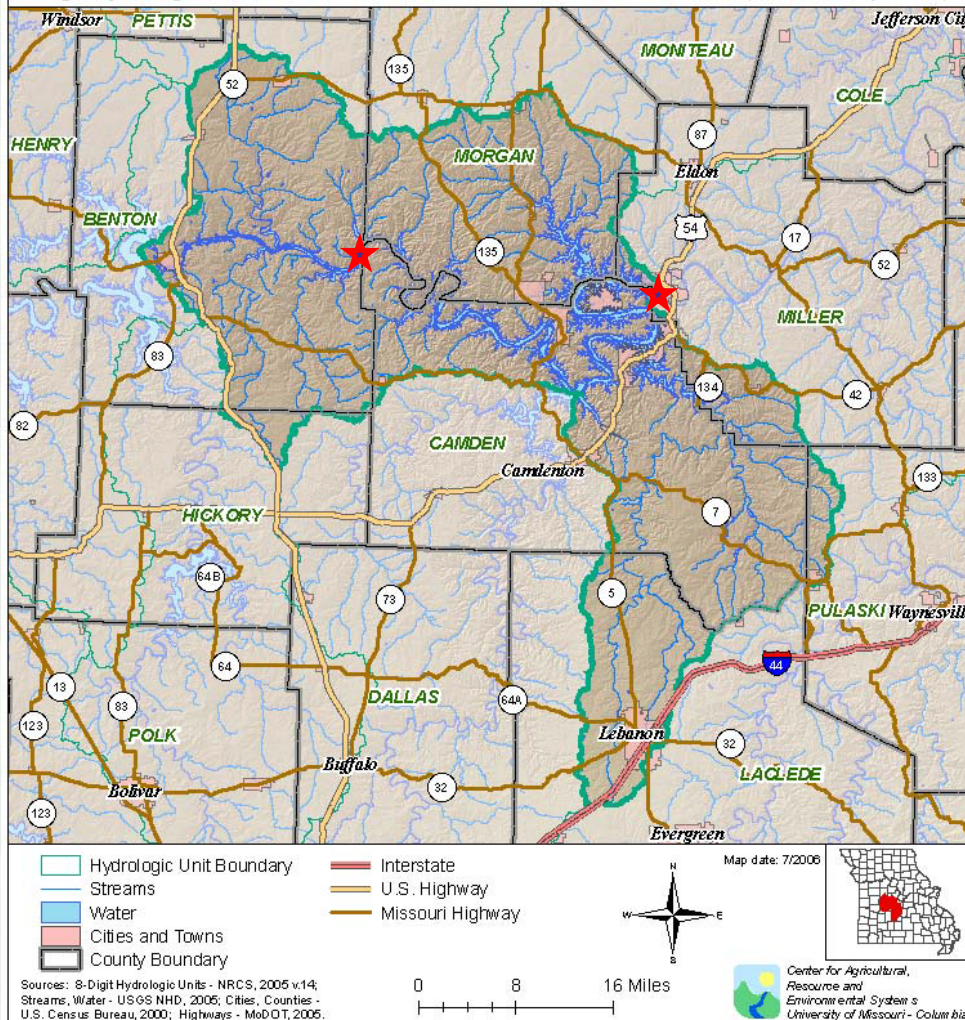


Inflows

Lake of the Ozarks

8-Digit Hydrologic Unit: 10290109

886,520 Acres (1,385.19 Sq. Miles)



Approximately 1,400 square miles of uncontrolled drainage area upstream of Bagnell Dam.

Approximately 8,000 square miles of uncontrolled drainage area upstream of Harry S. Truman Dam.

Inflow forecasts to account for runoff from these uncontrolled areas are essential to scheduling releases and by extension, hydropower.



Daily Coordination

WM communicates daily with the following:

- [National Weather Service](#)
- [U.S. Geological Survey](#)
- [Southwestern Power Administration](#)
- [Ameren](#)



Daily Data Collection and Exchange

- NWS to USACE
 - ▶ Lake inflow forecast
 - ▶ River flow forecast
 - ▶ Precipitation records
 - ▶ Forecasted precipitation
- USACE to NWS
 - ▶ Lake release changes
 - ▶ Lake forecasts: [web-based reports, publicly accessible](#)
- USGS
 - ▶ River and lake gages



USACE KCD Daily Reports:

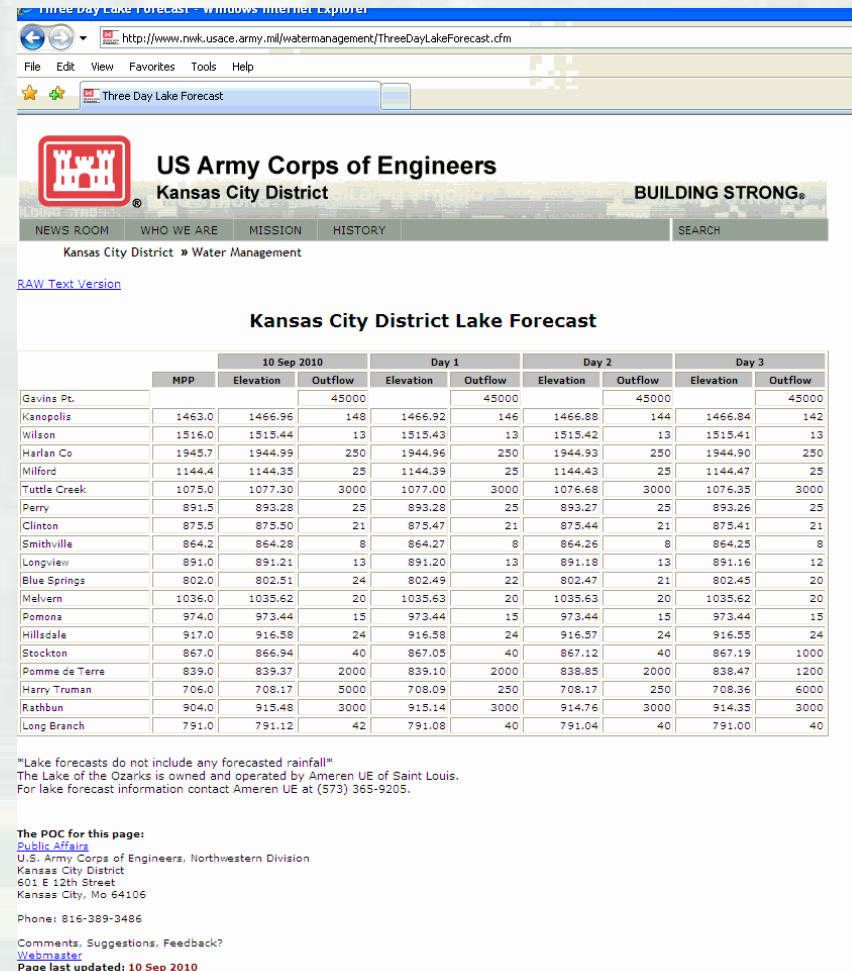
<http://www.nwk.usace.army.mil/watermanagement/>



The screenshot shows the homepage of the USACE KCD Daily Reports website. The header includes the US Army Corps of Engineers logo and the text "US Army Corps of Engineers Kansas City District BUILDING STRONG®". Below the header is a navigation bar with links: NEWS ROOM, WHO WE ARE, MISSION, HISTORY, and a SEARCH box. The main content area is divided into several sections:

- Water Management**: Includes contact information (Phone: (816)389-3545, Fax: (816)389-2011), links to District Map, Links to Each Corps Lake, Missouri Basin River and Reservoir Conditions, Missouri River Flow Frequency Information, Annual Report of Reservoir Regulation Activities, USGS Current Stream Flow Data (with links for United States, Missouri, Kansas, Nebraska, Iowa, and Historic Stream and Peak Flow Data), and USGS Lake Gages (with links for Missouri, Kansas, Nebraska, and Iowa).
- Kansas City Area Weather**: Includes links to National Weather Maps, District Radar, NWS Regional Radar, Kansas City Radar, Overland Park Flood Warning System, NWS Watches, Warnings, and Kansas City Forecast.
- Water Management Daily Reports**: Includes links to Key Gages (Radio Room Report) (RAW Data), MRR Daily River Bulletin, NWK Daily Reservoir Data (RAW Data), 8-Day River Report (RAW Data), 8-Day Reservoir Report (RAW Data), 3-Day Reservoir Forecast (RAW Data), and Other River and Lake Information (with links to Missouri River Forecast Center, NWS Kansas River Forecasts, NWS Missouri River Forecasts, NWS River Watch, NRC OPP Forecasts, and USBR River and Dam Data).
- National Weather Service**: Includes links to Interactive Weather Information Network, Hydrologic Information Center, and Missouri Basin River Forecast Center.
- Other Sites of Interest**: Includes links to Corps Headquarters Organization, public information, and links to the Army Home Page, Northwestern Division, Other Corps Division and Districts, U.S. Bureau of Reclamation, Dams, river operations, links to the USBR Home Page, U.S. Geological Survey Water Resource Data, and a link to the USGS Home Page.

At the bottom, there is a footer with contact information for the POC for this page (Public Affairs, U.S. Army Corps of Engineers, Northwestern Division, Kansas City District, 601 E 12th Street, Kansas City, Mo 64106), phone number (816-389-3486), and a page last updated date of 20 May 2010.



The screenshot shows the "Three Day Lake Forecast" page on the USACE KCD Daily Reports website. The header is identical to the homepage. The main content area features the "Kansas City District Lake Forecast" section, which includes a table of lake forecasts for 10 Sep 2010, Day 1, Day 2, and Day 3. The table columns are MPP, Elevation, and Outflow. The rows list various lakes and their corresponding forecast values.

	10 Sep 2010			Day 1		Day 2		Day 3	
	MPP	Elevation	Outflow	Elevation	Outflow	Elevation	Outflow	Elevation	Outflow
Gavins Pt.			45000		45000		45000		45000
Kanopolis	1463.0	1466.96	148	1466.92	146	1466.88	144	1466.84	142
Wilson	1516.0	1515.44	13	1515.43	13	1515.42	13	1515.41	13
Harlan Co	1945.7	1944.99	250	1944.96	250	1944.93	250	1944.90	250
Milford	1144.4	1144.35	25	1144.39	25	1144.43	25	1144.47	25
Tuttle Creek	1075.0	1077.30	3000	1077.00	3000	1076.68	3000	1076.35	3000
Perry	891.5	893.28	25	893.28	25	893.27	25	893.26	25
Clinton	875.5	875.50	21	875.47	21	875.44	21	875.41	21
Smithville	864.2	864.28	8	864.27	8	864.26	8	864.25	8
Longview	891.0	891.21	13	891.20	13	891.18	13	891.16	12
Blue Springs	802.0	802.51	24	802.49	22	802.47	21	802.45	20
Melvern	1036.0	1035.62	20	1035.63	20	1035.63	20	1035.62	20
Pomona	974.0	973.44	15	973.44	15	973.44	15	973.44	15
Hillsdale	917.0	916.58	24	916.58	24	916.57	24	916.55	24
Stockton	867.0	866.94	40	867.05	40	867.12	40	867.19	1000
Pomme de Terre	839.0	839.37	2000	839.10	2000	838.85	2000	838.47	1200
Harry Truman	706.0	708.17	5000	708.09	250	708.17	250	708.36	6000
Rathbun	904.0	915.48	3000	915.14	3000	914.76	3000	914.35	3000
Long Branch	791.0	791.12	42	791.08	40	791.04	40	791.00	40

Below the table, there is a note: "Lake forecasts do not include any forecasted rainfall". The Lake of the Ozarks is owned and operated by Ameren UE of Saint Louis. For lake forecast information contact Ameren UE at (573) 355-9205.

At the bottom, there is a footer with contact information for the POC for this page (Public Affairs, U.S. Army Corps of Engineers, Northwestern Division, Kansas City District, 601 E 12th Street, Kansas City, Mo 64106), phone number (816-389-3486), and a page last updated date of 10 Sep 2010.

Kansas City District, Water Management Section
Department Line: (816) 389-3545



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Southwestern Power Administration



- Schedule power generation for parts of Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas from 24 USACE multipurpose dams
- Memorandum of Understanding (MOU) with KCD
- Coordinates Stockton and Truman releases for power generation



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Memorandum of Understanding

USACE and SWPA

- ▶ Information exchange
 - USACE: water available
 - SWPA: power needs
- ▶ Daily lake inflow
- ▶ Downstream flooding: USACE may shut down
- ▶ Truman Firm Power
 - Regardless of downstream conditions
 - 2 units for 2 hours
 - Once per 24 hours, midnight to midnight



Ameren

- Lake of the Ozarks, Bagnell Dam
- Memorandum of Agreement (MOA)
- Daily coordination



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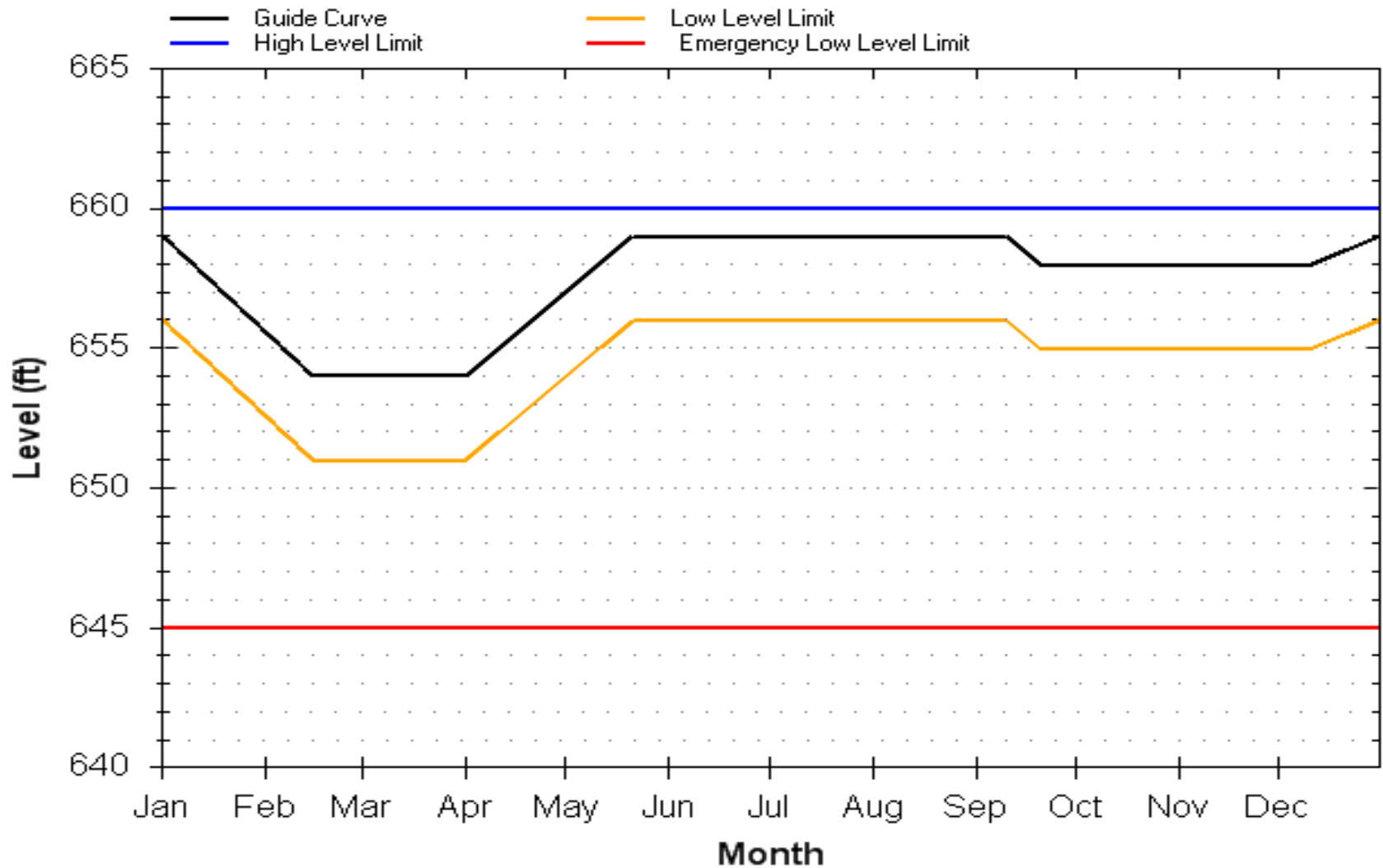
Memorandum of Agreement

USACE and Ameren

- ▶ Ameren will curtail release at USACE request due to downstream flooding
- ▶ Ameren may pass their local inflows during flood events
- ▶ Ameren and USACE coordinate releases from both projects on a daily basis



Lake of the Ozark's 2010 Guide Curve



Consensus Operating Plan

Agreement among State of Missouri, SWPA, and USACE until pumpback is viable

- Defines rules for power generation operation
 - ▶ Establishes rate of taking off or bringing on units
 - ▶ Quantifies wait time before changing more units
 - ▶ Defines conditions which require minimum of one unit to run continually
 - ▶ Addresses weekday peaking operations
 - ▶ Addresses weekend and holiday operations

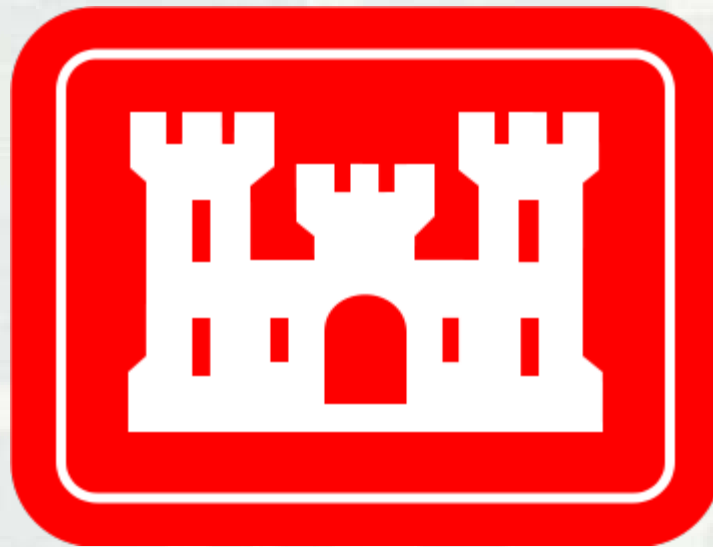


Summary of Harry S. Truman Reservoir Operations

- USACE operates Harry S. Truman Reservoir to balance all authorized purposes
- Numerous Federal, State, and local stakeholders interests are considered when regulating reservoir releases



Thank you for your interest



in Harry S. Truman Reservoir.



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